

ANIMAL SCIENCE

Curriculum Content Framework

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ANIMAL SCIENCE

Grade Levels: 10, 11, 12
Course Code: 491015

Prerequisites: Agriculture Science & Technology or Agriculture Science

Course Description: Topics covered in Animal Science include animal biotechnology, animal behavior, classification, consumer concerns, animal welfare, genetics, scientific selection, reproduction, growth and development, nutrition, meat science, and diseases.

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Unit 1: Overview of Animal Science

5 Hours

Terminology: Cattle, CDE, Equine, Goats, Poultry, SAE, Sheep, Swine

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
1.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
1.2 List the five major types of livestock in the United States	1.2.1 Locate major geographical regions of production for each type of livestock	Foundation	Speaking	Participates in conversation, discussion, and group presentations [1.5.8]
		Personal Management	Career Awareness, Development, & Mobility	Explores career opportunities [3.1.6]
		Thinking	Creative Thinking	Prepares presentation based on subject research, interviews, surveys [4.1.10]
			Knowing how to Learn	Develops personal learning strategies—note taking, clustering related items, flash cards, etc. [4.3.2]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
1.3 Examine the importance of livestock to the United States' economy		Foundation	Listening	Comprehends ideas and concepts related to animal science [1.2.1]
		Interpersonal	Cultural Diversity	Comprehends ideas and concepts related to animal science [2.2.1]
		Personal Management	Integrity/Honesty/Work Ethic	Follows established rules, regulations, and policies [3.2.5]
		Thinking	Knowing how to Learn	Applies new knowledge and skills to animal science [4.3.1]
1.4 Identify products obtained from livestock	1.4.1 List products obtained from livestock	Foundation	Writing	Takes notes from various sources [1.6.18]
		Personal Management	Career Awareness, Development, & Mobility	Comprehends ideas and concepts related to animal science [3.1.3]
			Decision Making	Generates options/alternatives [4.2.6]
		Thinking	Knowing how to Learn	Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]
1.5 Identify career opportunities in animal science	1.5.1 Research a career in animal science to determine educational requirements, working conditions, and salary	Foundation	Reading	Uses standard occupational resource materials [1.3.22]
				Uses written resources (books, dictionaries, directories, computers, Internet) to obtain factual information [1.3.23]
			Speaking	Asks questions to clarify information [1.5.3]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
		Personal Management	Career Awareness, Development, & Mobility	Sets well-defined and realistic personal/career goals (short-term and long-term) [3.1.11]
1.6 Identify FFA activities and programs of interest to students involved in animal science	1.6.1 List activities available in animal science	Foundation	Listening	Receives and interprets verbal messages [1.2.8]
		Personal Management	Integrity/Honesty/Work Ethic	Complies with safety and health rules in a given work environment [3.2.2]
			Organizational Effectiveness	Presents personal skills as benefits for company objective [3.3.7]
		Thinking	Knowing how to Learn	Processes new information as related to workplace [4.3.5]

Unit 2: Genetics and Animal Breeding

15 Hours

Terminology: Cell, Chromosome, Crossbreeding, Gene, Genotype, Phenotype, Pure breeding

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
2.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
2.2 Discuss Mendel's contributions to the study of genetics	2.2.1 Research Mendel's genetic experiments	Foundation	Listening	Listens for long-term contexts [1.2.7]
		Thinking	Creative Thinking	Prepares presentation based on subject research, interviews, surveys [4.1.10]
			Knowing how to Learn	Applies new knowledge and skills to genetics and animal breeding [4.3.1]
2.3 Explain the functions of cells, chromosomes, and genes		Foundation	Writing	Presents answers/conclusions in a clear and understandable form [1.6.13]
		Personal Management	Career Awareness, Development, & Mobility	Meets defined goals and objectives [3.1.9]
			Integrity/Honesty/Work Ethic	Chooses ethical course of action [3.2.1]
2.4 Differentiate between genotype and phenotype		Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7]
		Thinking	Creative Thinking	Uses imagination to create something new [4.1.1]
			Knowing how to Learn	Develops personal learning strategies—note taking, clustering related items, flash cards, etc. [4.3.2]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
2.5 Compare pure breeding and crossbreeding	2.5.1 Determine genotype and phenotype of crossbred animals using a Punnett Square	Foundation	Reading	Distinguishes between fact and opinion [1.3.11]
		Personal Management	Career Awareness, Development, & Mobility	Explores career opportunities [3.1.6]
			Integrity/Honesty/Work Ethic	Follows established rules, regulations, and policies [3.2.5]
2.6 Identify factors to consider in selecting breeding animals	2.6.1 Discuss EPDs	Foundation	Reading	Identifies relevant details, facts, and specifications [1.3.16]
		Thinking	Decision Making	Comprehends ideas and concepts related to genetics and animal breeding [4.2.2] Generates options/alternatives [4.2.6]
2.7 Discuss artificial insemination		Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
		Interpersonal	Cultural Diversity	Comprehends ideas and concepts related to genetics and animal breeding [2.2.1]
		Personal Management	Career Awareness, Development, & Mobility	Explores career opportunities [3.1.6]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
2.8 Discuss genetic engineering and its effect on the livestock industry		Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
		Interpersonal	Cultural Diversity	Comprehends ideas and concepts related to genetics and animal breeding [2.2.1]
		Personal Management	Career Awareness, Development, & Mobility	Explores career opportunities [3.1.6]

Unit 3: Feeding Livestock

10 Hours

Terminology: Abortion, Anemia, Balanced ration, Bloat, Carbohydrates, Concentrate, Fats, Milk fever, Mineral, Pharmaceuticals, Protein, TDN, Vitamin, Vitamin deficiency, Water

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
3.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to a subject [1.3.6]
3.2 Compare the differences in ruminant and nonruminant digestive systems	3.2.1 Label the parts of a ruminant and a nonruminant digestive system	Foundation	Science	Applies knowledge to complete a practical task [1.4.3]
		Thinking	Creative Thinking	Makes connections between seemingly unrelated ideas [4.1.6]
			Knowing how to Learn	Applies new knowledge and skills to feeding livestock [4.3.1]
3.3 Identify the three functions of feeds		Foundation	Writing	Adapts notes to a proper form [1.6.1]
		Personal Management	Career Awareness, Development, & Mobility	Meets defined goals and objectives [3.1.9]
		Thinking	Know how to Learn	Applies new knowledge and skills to feeding livestock [4.3.1]
3.4 Identify the major classes of nutrients		Foundation	Listening	Responds nonverbally to conversation [1.2.9]
		Thinking	Creative Thinking	Develops visual aids to create audience interest [4.1.4]
			Decision Making	Generates options/alternatives [4.2.6]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
3.5 Classify livestock feeds	3.5.1 Identify samples of livestock feed by class	Foundation	Reading	Uses appropriate materials and techniques as specified [1.3.20]	
		Thinking	Decision Making	Generates options/alternatives [4.2.6] Identifies pros and cons to assist in decision-making process [4.2.7]	
3.6 Describe the methods of processing feeds	3.6.1 Tour a feed mill to observe how feeds are processed	Foundation	Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]	
		Personal Management	Integrity/Honesty/Work Ethic	Complies with safety and health rules in a given work environment [3.2.2]	
		Thinking	Creative Thinking	Combines ideas or information in a new way [4.1.2]	
3.7 List factors to consider when evaluating feeds	3.7.1 Study feed tags		Knowing how to Learn	Applies new knowledge and skills to feeding livestock [4.3.1]	
		Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]	
		Personal Management	Integrity/Honesty/Work Ethic	Complies with safety and health rules in a given work environment [3.2.2] Follows established rules, regulations, and policies [3.2.5]	
		Thinking	Decision Making	Identifies pros and cons to assist in decision-making process [4.2.7]	

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do				ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge		Application		Skill Group	Skill	Description
3.8	Explain the process of balancing rations	3.8.1	Balance rations using the Pearson Square method, the Net Energy method, and the computer method	Foundation	Math	Applies addition, subtraction, multiplication, and division to real-world situations [1.1.1]
						Calculates/Estimates rations [1.1.8]
				Thinking	Decision Making	Evaluates information/data to make the best decision [4.2.5]
						Generates options/alternatives [4.2.6]
3.9	Identify diseases that result from poor nutrition	3.9.1	List diseases	Foundation	Reading	Analyzes and applies what has been read to specific task [1.3.2]
				Personal Management	Career Awareness, Development, &d Mobility	Establishes and implements a plan of action [3.1.5]
					Integrity/Honesty/ Work Ethic	Chooses ethical course of action [3.2.1]
				Thinking	Decision Making	Accepts responsibility for decision [4.2.1]

Unit 4: Livestock Buildings and Equipment

15 Hours

Terminology: Compost, Lagoon, Silo

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
4.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
4.2 Discuss the considerations in selecting sites for livestock buildings and facilities	4.2.1 Develop a plan that includes the following considerations: wind direction, drainage, central location, purpose	Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]
		Thinking	Problem Solving	Revises plan of action indicated by findings [4.4.9]
			Seeing Things in the Mind's Eye	Organizes and processes images—symbols, pictures, graphs, objects, etc. [4.6.2]
4.3 List the factors to consider when designing livestock buildings	4.3.1 Design a barn suitable for both livestock use and storage of feed and equipment	Foundation	Writing	Applies/Uses technical words and concepts [1.6.4]
		Thinking	Problem Solving	Revises plan of action indicated by findings [4.4.9]
			Reasoning	Uses logic to draw conclusions from available information [4.5.6]
4.4 Discuss environmental conditions best suited to various livestock species	4.4.1 Determine where various types of livestock should be raised	Foundation	Science	Analyzes environmental issues (ecology, pollution, waste management) [1.4.2]
		Interpersonal	Negotiation	Works to resolve conflict between two or more individuals [2.5.3]
		Thinking	Seeing Things in the Mind's Eye	Organizes and processes images—symbols, pictures, graphs, objects, etc. [4.6.2]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
4.5 Compare different types of floors used in livestock buildings		Foundation	Reading	Applies information and concepts derived from printed materials [1.3.3]
		Interpersonal	Negotiation	Works to resolve conflict between two or more individuals [2.5.3]
		Thinking	Problem Solving	Revises plan of action indicated by findings [4.4.9]
4.6 Compare various types of silos		Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
		Thinking	Decision Making	Comprehends ideas and concepts related to livestock buildings and equipment [4.2.2]
			Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.7 Explain why manure disposal is such an important environmental issue	4.7.1 Invite a County Extension Agent or Soil Conservationist to talk to the class about environmental regulations associated with livestock production	Foundation	Science	Analyzes environmental issues (ecology, pollution, waste management) [1.4.2]
		Interpersonal	Cultural Diversity	Comprehends ideas and concepts related to livestock buildings and equipment [2.2.1]
		Thinking	Problem Solving	Tracks and evaluates results [4.4.10]
4.8 List methods of storing and disposing of manure		Foundation	Science	Follows safety guidelines [1.4.16]
		Thinking	Problem Solving	Tracks and evaluates results [4.4.10]
				Recognizes/Defines problem [4.4.8]
4.9 Compare various types of fencing used with livestock		Foundation	Speaking	Asks questions to obtain information [1.5.4]
		Thinking	Problem Solving	Tracks and evaluates results [4.4.10]
			Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]

Unit 5: Animal Health

15 Hours

Terminology: Bacteria, Carriers, Fungi, Parasites, Poison, Protozoa, Sanitation, Quarantine, Virus

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
5.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
5.2 Discuss the producer's responsibility in keeping livestock healthy		Foundation	Writing	Uses language, style, organization, and format appropriate to subject matter, purpose, and audience [1.6.19]
		Personal Management	Career Awareness, Development, & Mobility	Establishes and implements a plan of action [3.1.5]
			Integrity/Honesty/Work Ethic	Chooses ethical course of action [3.2.1]
5.3 Identify the causes of disease in animals	5.3.1 Report to the class about a common livestock disease you have researched	Foundation	Science	Constructs hypothesis [1.4.11]
		Thinking	Problem Solving	Revises plan of action indicated by findings [4.4.9]
				Recognizes/defines problem [4.4.8]
5.4 Explain how disease is transmitted among animals		Foundation	Writing	Applies/uses technical words and concepts [1.6.4]
		Thinking	Reasoning	Comprehends ideas and concepts related to animal health [4.5.2] Extracts rules or principles from written information [4.5.4]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
5.5 Discuss the role of housing and facilities in maintaining healthy livestock		Foundation	Speaking	Participates in conversation, discussion, and group presentations [1.5.8]
		Thinking	Problem Solving	Recognizes/Defines problem [4.4.8] Uses logic to draw conclusions from available information [4.5.6]
5.6 Identify protective measures that can be taken against parasites and disease		Foundation	Science	Acquires and processes scientific data [1.4.1]
		Thinking	Problem Solving	Revises plan of action indicated by findings [4.4.9]
			Decision Making	Generates options/alternatives [4.2.6]
5.7 Discuss federal regulations related to disease control in livestock	5.7.1 Interview a veterinarian about prevention and treatment of livestock diseases	Foundation	Science	Acquires and processes scientific data [1.4.1]
		Thinking	Problem Solving	Revises plan of action indicated by findings [4.4.9]
			Decision Making	Generates options/alternatives [4.2.6]
5.8 Explain the purpose of quarantines	5.8.1 Determine quarantine laws for your local area	Foundation	Writing	Presents own opinion in written form in a clear, concise manner [1.6.14]
		Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]
			Seeing Things in the Mind's Eye	Visualizes a finished product [4.6.4]

Unit 6: Marketing Livestock

10 Hours

Terminology: Auction markets, Beef checkoff, Demand, Electronic marketing, Packers and Stockyards Act, Private treaty, Shrinkage, Supply, Terminal market

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
6.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
6.2 Outline the history of livestock marketing in the United States		Foundation	Writing	Adapts notes to a proper form [1.6.1]
		Personal Management	Responsibility	Comprehends ideas and concepts related to marketing livestock [3.4.2]; pays close attention to details [3.4.8]
6.3 Compare the percentage of the food dollar that goes to marketing with the food dollar that goes to the farmer	6.3.1 Create a visual representation of the ratio between marketing costs and farm costs of food	Foundation	Math	Calculates percentages, ratios, proportions, decimals, and common fractions [1.1.10]
		Interpersonal	Teamwork	Comprehends ideas and concepts related to marketing livestock [2.6.1]
6.4 List four common methods of marketing livestock	6.4.1 Outline the commonalities and differences among auction, direct, electronic, and terminal markets	Foundation	Writing	Records data [1.6.16]
		Interpersonal	Coaching	Comprehends ideas and concepts related to marketing livestock [2.1.1]
6.5 Discuss considerations in shipping livestock	6.5.1 Create working facilities for livestock to decrease stress before shipping to market		Writing	Organizes information in an appropriate format [1.6.10]
			Teamwork	Comprehends ideas and concepts related to marketing livestock [2.6.1]
			Creative Thinking	Uses imagination to create something new [4.1.1]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
6.6 Explain the role of federal and state agencies in livestock marketing		Foundation	Speaking	Adapts notes to a proper form [1.6.1]
			Writing	Uses language, style, organization, and format appropriate to subject matter, purpose, and audience [1.6.19]
		Interpersonal	Leadership	Comprehends ideas and concepts related to marketing livestock [2.4.2]
6.7 Identify sources of livestock market news	6.7.1 Locate current livestock market news on the Internet	Foundation	Reading	Identifies relevant details, facts, and specifications [1.3.16]
6.8 List factors that influence market supplies and prices of livestock	6.8.1 Look in local media for current events affecting livestock prices	Foundation	Writing	Presents own opinion in written form in a clear, concise manner [1.6.14]
		Personal Management	Responsibility	Pays close attention to details [3.4.8]
		Thinking	Knowing how to Learn	Applies new knowledge and skills to marketing livestock [4.3.1]
6.9 Discuss futures and options trading		Foundation	Writing	Prepares a complex document in a concise manner [1.6.12]
		Interpersonal	Coaching	Comprehends ideas and concepts related to marketing livestock [2.1.1]
		Thinking	Creative Thinking	Combines ideas or information in new way [4.1.2]

Unit 7: Meat & Animal Byproducts

15 Hours

Terminology: Kosher, Vacuum sealing, Yield grade

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
7.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
7.2 List the federal grades of meat	7.2.1 Outline the differences among prime, choice, select, standard, commercial, utility, cutter, and canner	Foundation	Listening	Responds nonverbally to conversation [1.2.9]
		Personal Management	Integrity/Honesty/Work Ethic	Complies with safety and health rules in a given work environment [3.2.2] Follows established rules, regulations, and policies [3.2.5]
7.3 Explain the kosher process	7.3.1 Determine the availability of kosher products in your area	Foundation	Writing	Organizes information into an appropriate format [1.6.10]
		Interpersonal	Cultural Diversity	Respects others' personal values, cultures, and traditions [2.2.4]
		Thinking	Knowing how to Learn	Applies new knowledge and skills to meat and animal byproducts [4.3.1] Uses available resources to apply new skills [4.3.6]
7.4 Explain how the price of meat is determined		Foundation	Reading	Comprehends written specifications and applies them to a task [1.3.9]
		Personal Management	Integrity/Honesty/Work Ethic	Chooses ethical course of action [3.2.1]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
7.5 Compare the amount of meat imported and exported by the United States		Foundation Thinking	Writing Creative Thinking	Takes notes from various sources [1.6.18] Develops visual aids to create audience interest [4.1.4] Makes connections between seemingly unrelated ideas [4.1.6]
7.6 Discuss trends in processing meat	7.6.1 Visit a large supermarket to observe various forms of processed meat	Foundation Interpersonal	Listening Cultural Diversity	Evaluates oral information/presentation [1.2.2] Recognizes differences among team members [2.2.3] Respects others' personal values, cultures, and traditions [2.2.4]
7.7 List important byproducts obtained from livestock		Foundation Thinking	Reading Creative Thinking	Comprehends written information for main ideas [1.3.7] Combines ideas or information in new way [4.1.2] Finds new ways of dealing with existing problems/situations [4.1.5]

Unit 8: Business Aspects of Livestock Production

10 Hours

Terminology: Budget, Corporation, Credit, Manager, Partnership, Sole proprietor

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
8.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
8.2 Identify three major types of business organizations found among farm enterprises	8.2.1 List real-life examples of each of the three types of business organizations	Foundation	Writing	Adapts notes to a proper form [1.6.1]
		Personal Management	Organizational Effectiveness	Comprehends the organization's modes of operation [3.3.5] Identifies characteristics desired by organization [3.3.6]
8.3 List characteristics of a good manager		Foundation	Listening	Listens for content [1.2.3]
		Personal Management	Integrity/Honesty/Work Ethic	Describes desirable worker characteristics [3.2.3] Describes/Explains significance of integrity, honesty, and work ethics [3.2.4]
8.4 Describe types and sources of credit in the livestock business	8.4.1 Invite a loan officer to talk to the class about types and sources of credit	Foundation	Listening	Evaluates oral information/presentation [1.2.2]
		Thinking	Decision Making	Comprehends ideas and concepts related to credit [4.2.2] Identifies pros and cons to assist in decision-making process [4.2.7]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
8.5 Explain the importance of record keeping in the livestock business		Foundation	Writing	Presents answers/conclusions in a clear and understandable form [1.6.13]
		Personal Management	Organizational Effectiveness	Identifies characteristics desired by organization [3.3.6] Promotes the goals and values of the organization [3.3.8]
8.6 Discuss considerations in setting up a budget for a livestock business	8.6.1 Develop a record-keeping system and budget using a computer	Foundation	Arithmetic/Mathematics	Expresses mathematical ideas and concepts orally and in writing [1.1.23]
		Thinking	Problem Solving	Devises and implements a plan of action to resolve a problem [4.4.3]
8.7 Analyze tax laws related to livestock producers		Foundation	Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]
		Personal Management	Integrity/Honesty/Work Ethic	Describes/Explains significance of integrity, honesty, and work ethics [3.2.4] Follows established rules, regulations, and policies [3.2.5]
8.8 Determine insurance needs for a livestock business		Foundation	Reading	Comprehends written information, and applies it to a task [1.3.8]
		Thinking	Decision Making	Considers risks when making a decision [4.2.3] Evaluates information/data to make the best decision [4.2.5]

Unit 9: Ethical Issues of Livestock Production

5 Hours

Terminology: Ethics, Mutation, PETA

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
9.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
9.2 Differentiate between animal welfare and animal rights		Foundation	Listening	Comprehends ideas and concepts related to ethical issues of livestock production [1.2.1]
		Thinking	Reasoning	Determines which conclusions are correct when given a set of facts and a set of conclusions [4.5.3] Uses logic to draw conclusions from available information [4.5.6]
9.3 Identify groups that are opposed to the production of livestock for food	9.3.1 Role-play situations involving confrontations with animal-rights groups	Foundations Interpersonal	Listening Cultural Diversity	Evaluates oral information/presentation [1.2.2] Recognizes differences among team members [2.2.3] Respects others' personal values, cultures, and traditions [2.2.4]
9.4 Discuss ethical considerations that have arisen from genetic engineering	9.4.1 Conduct a community survey to determine attitudes about genetic engineering	Foundation Interpersonal	Writing Cultural Diversity	Analyzes data, summarizes results, and makes conclusions [1.6.2] Respects others' personal values, cultures, and traditions [2.2.4] Works effectively with men and women from diverse backgrounds—ethnic, social, educational, etc. [2.2.5]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
9.5 List the positive and negative issues concerning livestock showing		Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]
		Thinking	Reasoning	Determines which conclusions are correct when given a set of facts and a set of conclusions [4.5.3.]
				Sees relationship between two or more ideas, objects, or situations [4.5.5]

Glossary

Unit 1: Overview of Animal Science

1. Cattle—male or female bovine raised for the production of beef and/or milk
2. CDE—Career Development Event
3. Equine—animals of the genus equus raised for work and recreational uses
4. Goats—any ruminant of the genus capra that is bred as a source of milk, meat, or fiber
5. Poultry—any fowl that are raised for the production of meat and /or eggs
6. SAE—Supervised Agriculture Experience
7. Sheep—ovine animals raised for the production of meat and fiber
8. Swine—animal of the family suidae raised for the production of pork (porcine)

Unit 2: Genetics & Animal Breeding

1. Cell—the basic unit of life
2. Chromosome—a strand of genetic material that contains genetic code
3. Crossbreeding—the breeding of two different pure breeds
4. Gene—a unit of inheritance composed of DNA
5. Genotype—genetic makeup of an animal
6. Phenotype—the outward expression of a gene
7. Pure breeding—the breeding of animals within the same breed

Unit 3: Feeding Livestock

1. Abortion—the presentation of a dead or underdeveloped fetus
2. Anemia—a deficiency of hemoglobin, iron, or red blood cells
3. Balanced ration—a daily allowance of livestock feed mixed to contain suitable nutrients to promote normal development, maintenance, lactation, or gestation
4. Bloat—a severe distension of the abdomen by gas; two types: dry and frothy
5. Carbohydrates—any certain organic chemical compounds of C, H, and O which include sugar and starches
6. Concentrate—feed that is high in energy and low in fiber
7. Fats—the oily or greasy substances found in certain plants
8. Milk fever—paralysis due to an imbalance of blood calcium, sugars, or magnesium
9. Mineral—a chemical compound or element of inorganic origin
10. Pharmaceuticals—products used for medicinal purposes
11. Protein—any of a large number of complex organic compounds of amino acids that is an essential part of all living things
12. TDN—total digestible nutrients; all nutrients consumed by an animal that are digested and used
13. Vitamin—an organic substance that performs specific and necessary functions in relatively small concentrates in an organism
14. Vitamin deficiency—a disease caused by the lack of one or more vitamins in the diet
15. Water—the most valuable natural resource

Unit 4: Livestock Buildings & Equipment

1. Compost—decomposing manure used as a soil additive
2. Lagoon—a body of water established for anaerobic decomposition of organic waste
3. Silo—a pit, trench, aboveground horizontal structure, or vertical cylinder structure of relatively airtight construction into which green crops, such as corn, grass, legumes, or small grain and other feeds, are placed and converted into silage for later use

Unit 5: Animal Health

1. Bacteria—single-cell microorganisms that cause disease in animals
2. Carriers—any organism that carries disease
3. Fungi—plant-like organisms that have no chlorophyll
4. Parasites—organisms that live in or on a host
5. Poison—any substance toxic to the animal
6. Protozoa—a group of one-cell organisms sometimes classified as one-cell animals, including amoebae and paramecia
7. Sanitation—aseptic clean condition
8. Quarantine—a period of time livestock are held away from other animals
9. Virus—a self-reproducing agent that is smaller than bacteria and can multiply only within living cells of a host

10. **Unit 6: Marketing Livestock**

1. Auction markets—livestock are sold by public bidding with the animal going to the highest bidder
2. Beef checkoff—an established \$1 per head checkoff for every head of beef sold in the United States
3. Demand—the amount of product buyers will purchase at a given time for a given price
4. Electronic marketing—a form of auction selling used mainly for marketing feeder cattle
5. Packers and Stockyards Act—a federal law that is administered by the USDA that deals with the movement of livestock across state lines
6. Private treaty—a sale made directly between a producer and buyer
7. Shrinkage—loss of weight that occurs when livestock are moved to market
8. Supply—amount of product that producers will offer for sale at a given price at a given time
9. Terminal market—livestock sold directly to the packer

Unit 7: Meat & Animal Byproducts

1. Kosher—a special way of preparing meats for consumption required by Jewish law
2. Vacuum sealing—a process of packaging by removing air and sealing in plastic
3. Yield grade—determined by amount of edible product

Unit 8: Business Aspects of Livestock Production

1. Budget—the amount of capital set aside for a given period
2. Corporation—an agreement for carrying out a farming enterprise as an entity distinct from the individuals that control it
3. Credit—ability to borrow money
4. Manager—the operator who conducts, controls, and directs the livestock operation
5. Partnership—an association of two or more people who operate the business
6. Sole proprietor—owned and operated by one individual

Unit 9: Ethical Issues of Livestock Production

1. Ethics—treatment of livestock to ensure maximum production and optimal welfare of the animals
2. Mutation—an accident of heredity in which an offspring has different characteristics than the genetic code intended
3. PETA—People for the Ethical Treatment of Animals

Appendices

Appendix 1.2 Five major types of livestock:

1. Cattle
2. Swine
3. Equine
4. Sheep & goats
5. Poultry

Appendix 1.4 Products obtained from livestock:

1. Meat
2. Fiber
3. Pharmaceuticals
4. Byproducts (edible & inedible)

Appendix 3.3 Functions of feeds:

1. Growth
2. Maintenance
3. Lactation

Appendix 3.4 Major classes of nutrients:

1. Protein
2. Carbohydrates
3. Fats
4. Vitamins
5. Minerals
6. Water

Appendix 3.5 Classification of feeds:

1. Concentrates
2. Roughages

Appendix 3.6 Methods of processing feeds:

1. Grinding
2. Pelleting
3. Steam rolling
4. Mixing
5. Liquid
6. Cracking
7. Rolling
8. Extruding

Appendix 3.7 Factors to consider when selecting feed:

1. Protein content
2. Fat percentage
3. TDN
4. Fiber
5. Palatability

Appendix 3.9 Diseases from poor nutrition:

1. Abortion
2. Anemia
3. Bloat
4. Rickets
5. Vitamin deficiencies
6. Diarrhea
7. Milk fever
8. Calcium deficiencies

Appendix 4.3 Factors to consider when selecting a site:

1. Purpose
2. Cost
3. Location

Appendix 4.4 Environmental considerations:

1. Climate
2. Region

Appendix 4.5 Types of floors in livestock facilities:

1. Slatted (metal or wood)
2. Concrete
3. Sand
4. Gravel
5. Rubber
6. Wood chip/rice hulls

Appendix 4.6 Types of silos:

1. Vertical
2. Horizontal
3. Pit
4. Bunker
5. Stacked

Appendix 4.7 Environmental factors of manure disposal:

1. Odor
2. Bacteria
3. Runoff

Appendix 4.8 Methods of manure storage and disposal:

1. Lagoon
2. Broadcast
3. Compost

Appendix 4.9 Types of fencing used with livestock:

1. Barbed wire
2. Woven wire
3. Electric
4. Pipe
5. Wooden
6. Plastic
7. Combination

Appendix 5.2 Areas of producer responsibility:

1. Nutrition
2. Vaccination
3. Facilities
4. Sanitation

Appendix 6.2 History of livestock marketing:

1. Beef checkoff
2. Supply and demand
3. Marketing
4. Packers and Stockyards Act

Appendix 6.4 Four methods of marketing livestock:

1. Terminal markets
2. Auction markets
3. Electronic marketing
4. Private treaty

Appendix 7.7 Byproducts from livestock:

1. Inedible
2. Edible
3. Variety meats
4. Pharmaceuticals

Appendix 8.2 Three major types of business organizations found among farm enterprises:

1. Sole proprietor
2. Partnership
3. Corporation

Appendix 8.3 Traits of a good manager:

1. Responsible
2. Knowledgeable
3. Punctual
4. Practical

Appendix 8.4 Types and sources of credit:

1. Commercial banks
2. FMHA
3. Federal land bank
4. Production credit association

Appendix 8.6 Considerations in setting up a budget:

1. Type of livestock
2. Location
3. Scope of operation
4. Interest rates
5. Production costs
6. Production goals

Appendix 8.7 Tax laws related to livestock producers:

1. Deductions
2. Taxable income
3. Real estate taxes
4. Property taxes

Appendix 8.8 Insurance needs for a livestock business:

1. Property
2. Liability

Appendix 9.3 Group opposed to production of livestock for food:

1. PETA

Appendix 9.4 Ethical considerations that have arisen from genetic engineering:

1. Health threats
2. Mutations
3. Handling during time of unnatural insemination